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ABSTRACT

A Study of students' preferred learning styles at Sinclair Community College utilized the Learning Styles Inventory (LSI), which provides 100 discriminations within the following categories: Conditions, reflecting concern for learning situation dynamics; Content, indicating major areas of interest; Mode, showing the general modality through which learning is preferred; and Expectation, indicating the level of performance anticipated. Valid student responses numbered 968. Of this group the average student age was 28, with approximately 60% under 24 years, and half were classified as evening students. Younger students showed greater preference for both peer and teacher affiliation in the learning environment, inanimate (working with objects) content, iconic (pictorial) and direct experience modes, and overwhelmingly rejected reading as an educational technique. Older students preferred a structured environment stressing organization, detailed instructions and competition, qualitative (verbal) content, and listening and reading modes. The student population as a whole rejected numeric content or qualitative ideas. The disparity indicated in the preferred learning styles of elder and younger students suggests a need for new instructional strategies aimed at the younger generation. (LH)

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THE NEW GENERATION GAP:
INVOLVEMENT VS. INSTANT INFORMATION

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THE NEW GENERATION GAP:
INVOLVEMENT VS. INSTANT INFORMATION

Walter E. Hunter and Louise S. McCants

While community college educators have focused increasing attention on maintenance activities, the students attending these colleges have apparently undergone several subtle shifts. Young students of traditional college age can no longer be classified as typical. Rather, the influx of adults seeking upward mobility or personal enrichment has markedly changed the overall community college learning environment. Mature students, holding serious purposes and specific educational goals, are warmly welcomed by both teachers and administrators.

Although usually attending classes part-time, late afternoons or evenings, these students continue to hold the traditional values of reading, writing, and active participation. And community college teachers, responding positively to this population frequently request evening and Saturday time-slots in order to enjoy classes predominately composed of students over 24 years of age. This attention, however, may result in overlooking the students of traditional college age, who are products of a technological society and may thus differ with respect to learning conditions, mode, content, and expectation.

Indeed, it is possible that younger students differ dramatically from the more traditional students on the basis of educational perceptions, social relationships, and preferred learning styles. More important, educational strategies devised to respond to their preferences may well differ from the major portion of teaching methodologies. The complex progress of a technological age has developed a new generation that prefers iconics to books, rejects authority figures while delaying independence, deals comfortably with inanimates, and holds high grade expectations.

In fact, evidence is mounting that non-cognitive indicators may point to success or failure within a specific teaching-learning situation.

Preferences, affiliations, and expectations may prove to be powerful predictors of success or failure in that these non-cognitive indicators may define the intimacy with which an individual can relate to any specific learning activity or mode.

Educators frequently note that what really makes the difference is not "what is done" but "how it is done". Thus, it is possible that preferred styles of instruction may match or mismatch with preferred styles of learning. For most learners and their instructors, the extent of any mismatch between styles is probably undetected and thus not counteracted in any practical way. But differentiation of style by age reveals that younger college students hold preferences, affiliations, and expectations that have until recently been unsuspected and may for some time remain unwelcome.

Marshall McLuhan recently went beyond his earlier report, "The Medium is the Message," when he stated:

> "Television has peculiar dimensions that are ignored.... For the first time in 2,400 years, since the beginning of the alphabet, people are going back to their primitive third world. Because TV is post-alphabet, post-literate, the TV generation had no contact with its own parents or the previous world from which the parents came... the parents had not come out of the 19th century literacy and the kids were plunged into post-literacy. That is a big generation gap. It never happened before in the history of man because we never had electronic technology before" (Hickey, 1977, p. 7B).

By virtue of its accepted philosophy, the community college is committed to serve the needs of all components of its population, as outlined in these generally accepted principles:

1. A democratic society cannot exist wholesomely without well-educated citizenry.
2. Every effort must be expended to help each person make the most of his abilities.
3. The community college is designed to help the whole population (Thornton, 1956, p. 34).

The research in preferred learning styles indicates that acceptance of this philosophy constitutes an obligation to serve at least three intersecting sub-groups in the population: the new students, defined

by Cross (1971) with sympathy and sensitivity; the young students who may form an intersecting sub-set with the "new" students; and the mature students, who are committed to the values (including literary) espoused by the former generation.

Education has never existed independently of its environment, but the pressures placed on today's practitioners are uniquely intensified because of technology. Students under 24 years of age have lived their entire lives in a world that does little to develop patience on the part of the recipient. Systems of information, centuries in the making, have been displaced with the speed of light. Acceptance of instantaneous replays and pattern recognition leaves little room for the patience and perseverance necessary to develop literary awareness or logic or even basic skills in reading and arithmetic. Younger students are responding to the world in which they have been brought up by accepting its values--perfunctory recognition of authority figures, limited involvement, iconics, inanimates, and instant information retrieval--although not necessarily retaining for any length of time any of these.

To assume that all community college students prefer to learn in the same manner is unwise. Rather, one might better assume that adult students, recent high school graduates, and "new students" represent intersecting sub-sets. The primary purpose of the study described in this paper was to examine the preferred learning styles of students attending a typical comprehensive community college. A second purpose was to consider the impact of preferred style on educational delivery systems.

This study focused on two distinct student sub-groups--younger students and adult students. Younger students were defined as recent high school graduates who were attending college for the first time, were less than 24 years old, and were enrolled in all college programs. Thus, they included some culturally and/or educationally disadvantaged students. Adult students were defined as persons who were over 24 years old (with a mean age of 34), were typically part-timers, and were enrolled in all college programs. Some were returning to college, some were first-time college students, and some were culturally or educationally disadvantaged.

METHODOLOGY

The study of students' preferred learning styles at Sinclair Community College, Dayton, Ohio, was an outgrowth of a staff development project that was generated by a grass roots attempt by teachers to delineate factors associated with student learning. The instrument used was the Learning Styles Inventory, developed in 1973 by Albert A. Canfield and J. Clayton Lafferty. The L.S.I. utilizes a format of 25 items, each containing four response options that are ranked in terms of subjective preference. The L.S.I. provides 100 discriminations within four categories, entitled Conditions, Content, Mode, and Expectation.

I. CONDITIONS: These reflect concerns for the dynamics of the learning situation.

Peer: Working in student teams; relations with other students; having student friends, and so on.

Organization: Course work logically and clearly organized; meaningful assignments and sequence of activities.

Goal Setting: Setting one's own objectives; using feedback to modify goals or procedures; making one's own decisions on objectives.

Competition: Desiring comparison with others; needing to know how one is doing in relation to others.

Instructor: Knowing the instructor personally, having a mutual understanding; liking one another.

Detail: Specific information on assignments, requirements, rules, and so on.

Independence: Working alone and independently; determining one's own plan; doing things for oneself.

Authority: Desiring classroom discipline and maintenance of order; having informed and knowledgeable instructors.

II. CONTENT: Major areas of interest.

Numeric: Working with numbers and logic; computing; solving mathematical problems, and so on.

Qualitative: Working with words or language; writing, editing, talking.

Inanimate: Working with things; building, repairing, designing, operating.

People: Working with people; interviewing, counselling, selling, helping.

III. MODE: General modality through which learning is preferred.

Listening: Hearing information; lectures, tapes, speeches, and so on.

Reading: Examining the written word; reading texts, pamphlets, and so on.

Iconic: Viewing illustrations, movies, slides, pictures, graphs, and so on.

Direct Experience: Handling or performing; shop, laboratory, field trips, practice exercises, and so on.

IV. EXPECTATION: The level of performance anticipated.

Outstanding or superior level.

Above average or good level.

Average or satisfactory level.

Below average or unsatisfactory level.

Score: The students' relative prediction of anticipated level of performance.

Random selection of student respondents was effected by randomly choosing 30 teachers from the Sinclair faculty and asking these teachers to select two sections of students for participation in the project. This method afforded broad representations by age, program of study, and expectations. More than 1,200 students participated; incomplete and duplicate responses on some inventories reduced the total number of complete and valid responses to 968.

The average student age was 28, with approximately 60% (579) under 24 years old and some 40% (389), 24 years or older. Half the students were classified as evening students. Some 40% were in business-related courses, 30% in health professions, 6% in engineering, and 24% in liberal arts.

Inventories were administered during the first week of the quarter and information was returned during the third week. This allowed eight remaining weeks for the recognition of learning preferences in the development of teaching strategies. One of the unexpected beneficial side effects of the experiment was the teacher/student interaction afforded by the discussion of the individual scores. Thus the inventory,

known to have objective validity, was found to pass the test of subjective validity, as student after student confirmed with his instructor the significance of his scores in relation to the population norms.

FINDINGS

Means, standard deviations and t scores of the 968 respondents classified by items are displayed in Tables 2, 3, and 4. Comparisons of responses were classified by age:

Younger students, $x_1 < 24$ years of age (N = 579)

Adult students, $x_2 \geq 24$ years of age (N = 389)

Means of the distributions were found to differ beyond the 1% level for 11 of the 16 preference items on the Canfield Learning Styles Inventory. In all instances a score of 5 indicated maximum preference for a specific dimension while a score of 20 indicated minimum preference.

Table 1 illustrates the 1977 normative information and percentile ranks based on Sinclair students.

TABLE 1
NORMS FOR LEARNING STYLES INVENTORY

Percentiles

Categories	Scores:	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Peer Affiliation		99	99	97	93	87	78	69	58	45	33	23	13	6	3	0	0
Organization Structure		93	84	69	55	39	26	17	11	6	3	1	0	0	0	0	0
Goal Setting		99	97	94	89	82	73	59	43	27	16	8	3	1	0	0	0
Competition with Others		99	99	99	99	99	97	94	88	81	69	56	43	27	16	6	0
Teacher Affiliation		94	86	75	63	53	41	31	22	14	9	5	3	1	0	0	0
Detail Structure		93	86	79	70	58	44	32	21	13	7	3	1	0	0	0	0
Independence		99	99	98	96	94	90	83	75	65	50	38	26	15	6	2	0
Authority of Others		99	99	99	98	96	92	88	81	75	64	52	39	27	16	8	0
Numeric		97	95	91	85	81	74	68	62	55	47	40	32	24	17	10	0
Qualitative		99	96	92	88	82	74	66	59	51	41	34	25	17	9	4	0
Inanimate		96	92	87	81	73	63	55	47	38	29	21	14	9	5	2	0
People		89	81	74	64	54	47	39	30	23	18	10	6	4	2	0	0
Listening		95	91	83	73	62	53	41	30	20	13	8	3	2	1	0	0
Reading		99	98	97	95	91	88	81	74	65	58	48	40	30	21	10	0
Iconics		99	98	95	90	83	75	64	54	45	34	24	16	9	4	1	0
Direct Experience		93	87	81	73	64	54	44	34	28	20	13	9	5	2	1	0

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Table 2 lists comparative means, standard deviations and t ratios for the two age groups.

TABLE 2
COMPARISONS OF ADULTS 24 AND OVER WITH
OTHER STUDENTS AT SINCLAIR COMMUNITY COLLEGE USING
CANFIELD'S LEARNING STYLES INVENTORY

Conditions

Categories	Means x_1	Means x_2	Standard Deviations x_1	Standard Deviations x_2	t Scores
Affiliation--Peer	12.61	13.76	3.05	2.69	-6.16*
Structure--Organization	9.40	8.64	2.64	2.56	4.52*
Achievement--Goal Setting	11.99	12.05	2.71	2.50	-0.39
Eminence--Competition	16.00	15.55	2.53	2.63	2.64*
Affiliation--Instructor	9.68	10.62	3.08	3.19	-4.60*
Structure--Detail	10.40	9.73	2.91	3.02	3.43*
Achievement--Independence	14.51	14.40	2.95	2.90	0.57
Eminence--Authority	15.41	15.25	2.07	3.10	0.83

Note: *Significant beyond 1% level.

x_1 (Less than 24) N = 579 x_2 (24 and over) N = 389

The eight Condition scales, 1 through 4 and 5 through 8, should be discussed as interrelated categories in that students ranked responses corresponding to the broad dimensions of affiliation, structure, achievement and eminence.

Table 2 indicates striking disparities between young and mature students for both peer affiliation and organization structure preference. With t ratios of -6.16 and 4.52, important shifts of young students toward peer affiliation and away from organization structure are indicated. Similar distributions for both age groups are evident with respect to goal setting and competition. Other important differences occurring between students divided by age suggest that mature students, compared to their younger counterparts, show stronger preferences for detail structure and weaker preferences for instructor affiliation. The distributions illustrating independence and authority were similar for the two groups.

Mature students, then, are seen to differ from young students on five of the eight Condition Scales included in the Learning Styles Inventory. Mature students show stronger preferences for traditional dimensions of structure--organization and detail. The young students show somewhat stronger preference, for both peer and teacher affiliation.

As for Content, the Learning Styles Inventory includes four distinct categories: numeric or quantitative, qualitative, inanimate, and people. Distribution patterns ranking Content preferences show significant differences between the means of the two age groups in both qualitative and inanimate categories. Younger students prefer inanimate objects as learning vehicles, choosing this category over both numeric and qualitative. Both young and mature students most prefer working directly with people. Statistics and age comparisons for Content preferences are shown in Table 3.

TABLE 3
COMPARISONS OF ADULTS 24 AND OVER WITH
OTHER STUDENTS AT SINCLAIR COMMUNITY COLLEGE USING
CANFIELD'S LEARNING STYLES INVENTORY

Content

Categories	Means x_1	Means x_2	Standard Deviations x_1	Standard Deviations x_2	t Scores
Numeric	13.64	14.16	4.38	4.03	-1.88
Qualitative	13.77	12.96	3.94	3.61	3.27*
Inanimate	11.87	12.73	3.86	3.74	-3.47*
People	10.73	10.16	3.87	3.77	2.30

Note: *Significant beyond 1% level.

x_1 (Less than 24) N = 579 x_2 (24 and over) N = 389

Student preferences tending toward inanimate and people dimensions seem inconsistent in an era of technology. Since success in college is frequently dependent on a learner's mastery of both the numeric and the qualitative, college teachers have a special burden to increase and balance student preferences in these areas through sympathetically

structured learning experiences.

When it comes to the L.S.I. mode dimensions, students indicate comparable preferences for differing types of instruction, classified as listening, reading, iconics and direct experience. Table 4 lists t scores, means and standard deviations for the four dimensions under the Modes of Instruction category.

TABLE 4
COMPARISONS OF ADULTS 24 AND OVER WITH
OTHER STUDENTS AT SINCLAIR COMMUNITY COLLEGE USING
CANFIELD'S LEARNING STYLES INVENTORY

Modes

Categories	Means x_1	Means x_2	Standard Deviations x_1	Standard Deviations x_2	t Scores
Listening	11.12	10.44	3.24	3.16	3.24*
Reading	15.61	14.23	3.51	3.60	5.91*
Iconic	12.61	13.49	3.39	3.19	-4.10*
Direct Experience	10.66	11.83	3.56	3.90	-4.73*

Note: *Significant beyond 1% level.

x_1 (Less than 24) N = 579 x_2 (24 and over) N = 389

The similar patterns and significantly different means of the samples, as classified by age, are evident in Table 4. Both age groups prefer listening as a learning technique. The major difference revealed by the inventory is that younger students overwhelmingly reject reading as an educational technique. Approximately one half of all young students rank reading at the bottom of the distribution, choosing scores of 16 through 20, the points of maximum disinterest.

On the other hand, younger students show a somewhat stronger preference than the older group for iconics, or pictures, as a method of learning. That this method is preferred over reading is not a surprising selection for a generation reared in a televised technological world. Rejection of reading appears to vary proportionately with the acceptance of viewing. Finally, younger students show a preference for direct experiences. We thus see that younger students tend to

reject reading and prefer watching, while accepting listening and direct experience as methods of transmitting information.

Visual summaries of the findings of the Sinclair research project are provided in Figures 1 and 2, with significant differences between means indicated by asterisks. Comparisons show that neither group has a very strong preference for peer affiliation, goal-oriented achievement, independence, competition, or authority. Both age groups show strong preferences for teacher affiliation, evidence of structure in class organization, and detail.

Neither group has a preference for numeric content or qualitative ideas, preferring inanimate objects to the other three content categories. Students prefer listening, reject reading, are neutral toward iconics, and prefer direct experience. Current educational strategies must deal with these realities if the community college is to fulfill its mission to attend to all types of student populations.

In summary mature students are thus seen to differ from young students on 11 of the 16 style dimensions. Young students show greater preference for both peer and teacher affiliation (Figure 1),inanimate content, and iconic and direct experience mode (Figure 2). Mature students prefer detail and organization structure and competition (Figure 1), qualitative content, and listening and reading mode (Figure 2).

DISCUSSION

Undoubtedly, the differences in preferences and affiliations noted at Sinclair are also present within student populations at other institutions. Perhaps these subtle differences are the unseen, but not unfelt, driving force that caused Cross to "predict that once we have reached our goal of education for all, we will turn our attention to providing education for each." Cross went on to caution that "a 21st century goal of maximizing the impact of education on individuals is infinitely more complex and demanding than our 20th century goal of providing access for all...we are going to have to be more thoughtful in the years ahead" (Cross, 1976, p. 1).

FIGURE 1
COMPARISONS BY AGE AND BY CATEGORY

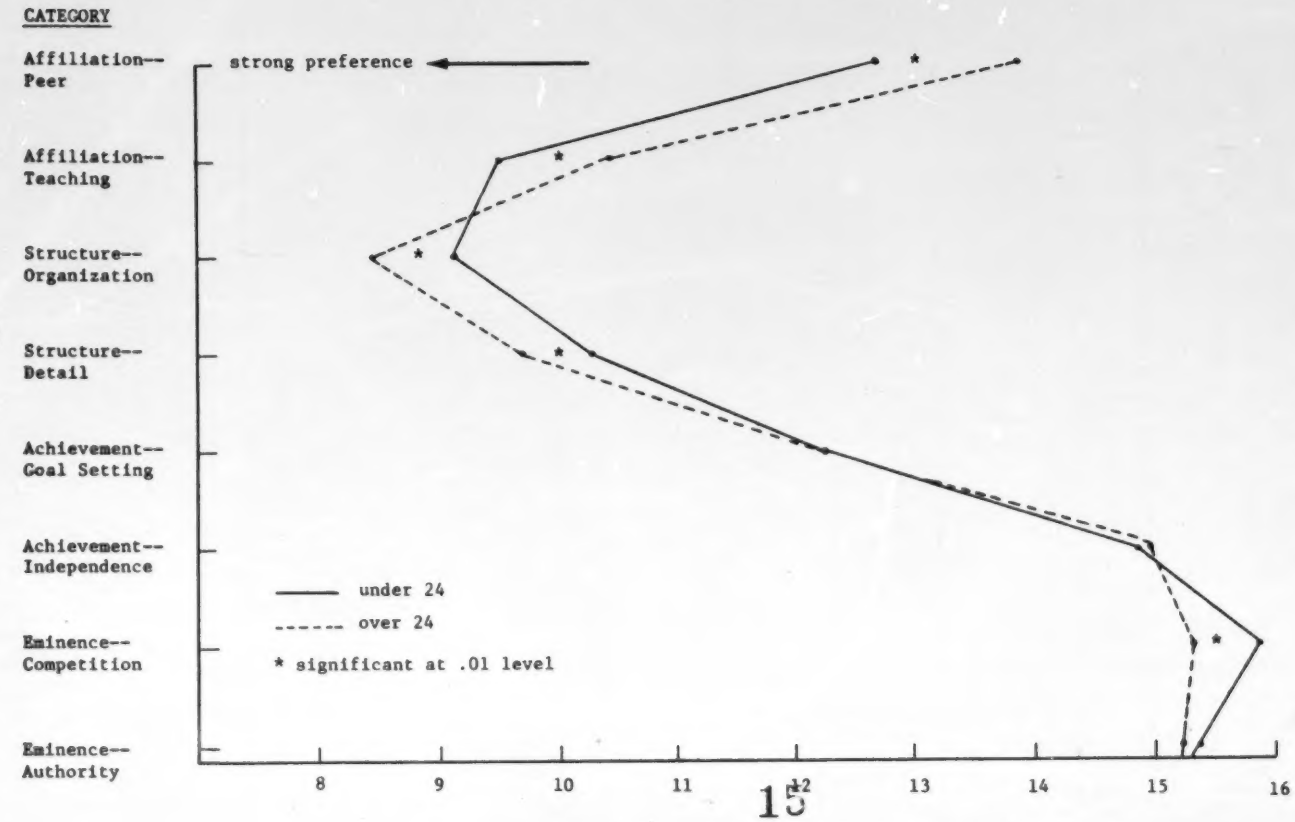
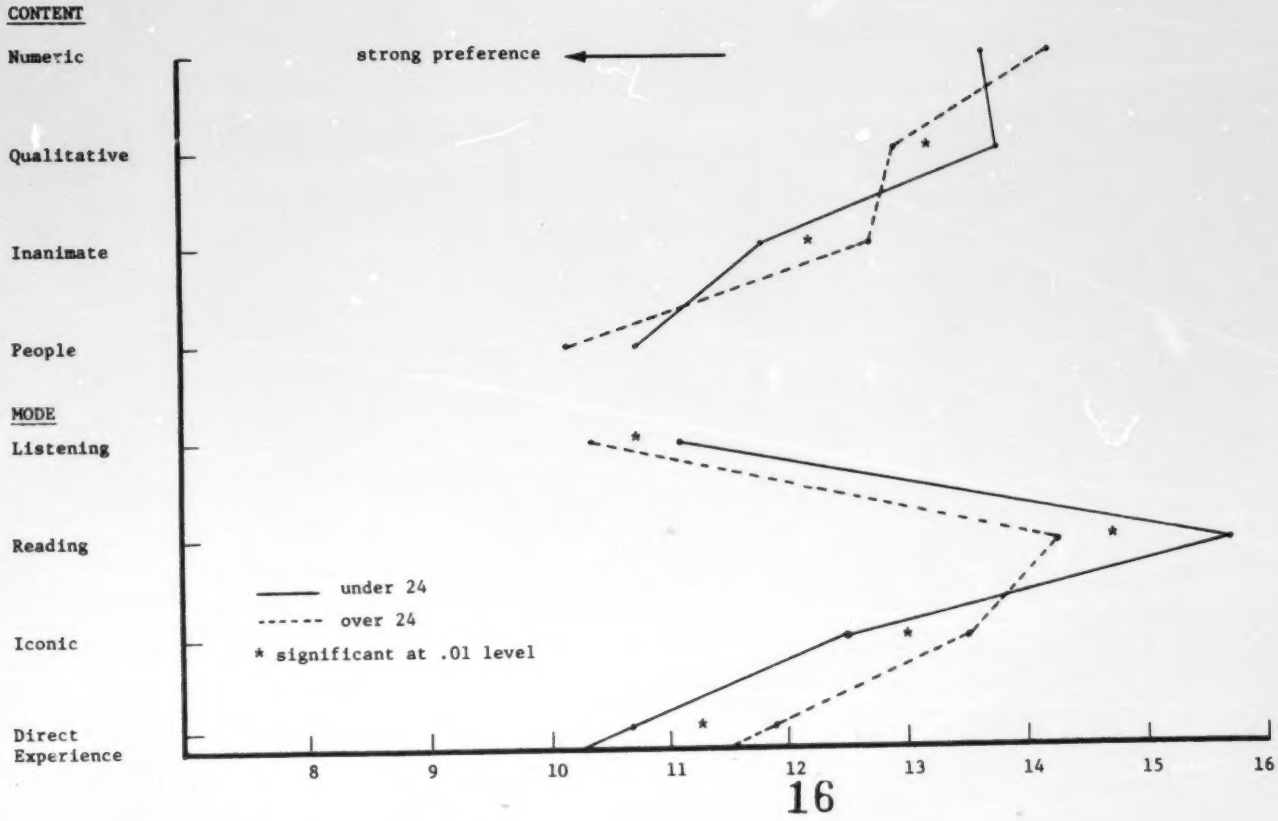


FIGURE 2
COMPARISON BY AGE, CONTENT, AND MODE



As educators consider the complex task of providing education for each, they will need to give serious consideration to both cognitive and non-cognitive factors. Individual learners appear to possess coping capacities that allow for significant variance in instructional style, course content, learning structure, and affiliation. However, we believe that dissonance within the teaching/learning interaction, like electrical resistance, lowers the efficiency of learning and eventually lowers the probability of student achievement. Certainly if instruction is designed to produce learning, educators will need to find ways to improve the match between the way instruction is delivered and the preferences of its clients.

Several thousand two-year college teachers are working on courses that are essentially individualized. In 1976, Hunter & Lingle completed a status report on individualized instruction in two-year colleges located within the 19-state North Central accreditation region. This report, based on responses from more than 1,000 practitioners of individualized instruction, confirmed that most practitioners of individualized instruction were self-motivated to provide education for each person enrolled in their course. It seems likely that the pressure to consider individual differences is real and that this pressure will have a measurable impact on future instructional systems.

Certainly college teachers have access to some information about their students--usually such cognitive data as grade point averages, aptitude test results, high school rank, curriculum patterns, and placement tests. Frequently such cognitive information has been disregarded or misinterpreted or used as an excuse for student failure. However, community college teachers have frequently modified their courses or developed new courses and new approaches to compensate for student differences in the cognitive realm. Concerned community college educators usually place students with lower grades or lower placement test results in special courses designed to increase the learners' probability of achievement in more advanced courses. These educators have assumed the mastery learning posture, taken by Bloom that "Most students (perhaps over 90 percent) can master what we have to teach

them, and it is the task of instruction to find the means which will enable our students to master the subject under consideration" (1968, p. 1).

Bloom's contention that most students can master what we have to teach is based on two premises. The first premise is, of course, that educators will determine what is meant by mastery of the subject. And the second premise follows that educators will determine ways to provide instruction that will increase the probability of student mastery of the desired outcomes. Finding ways to provide meaningful instruction must include giving attention to both cognitive and non-cognitive factors. Most previous attempts to provide instruction resulting in mastery of subject matter leaned heavily on cognitive information, course entry levels, course content, and mode of instruction. Future attempts to provide mastery instruction will need to consider also such non-cognitive factors as preferences, perceptions, and affiliations. Failure to include these types of non-cognitive factors will lower the probability of providing meaningful learning experiences for a sizable portion of the student population now attending colleges and universities.

However, attention to non-cognitive factors related to preferences and affiliations will need to be approached with care. Information from the Sinclair research indicates that students within the two age groups differ with respect to 11 of 16 items on the L.S.I. More important, an examination of the distribution on any measured L.S.I. item indicates a full range of differences about the sample means. These distributions relate directly to individual differences with respect to preferences and affiliation. Thus, by the very definition of these distributions, some learners differ from the item means by more than one standard deviation, and such differences suggest that a sizable proportion of the students enrolled in college courses may find any one instructional method dissonant with an identified preference or affiliation need. Students can and do accommodate to sizable differences in instructional method. However, large differences will result in less probability of achievement.

The optimistic expectations surrounding the community colleges a decade ago reflected America's commitment to equal opportunity in education. This egalitarian approach, admitting to higher education non-traditional students with widely varying expectations, has generated some searching questions regarding measurements of achievement and delivery of instruction. When Bruner, reviewing the progress of education during the sixties, noted that:

> "By 1970 the concern was no longer to change schools from within by curriculum, but to refit them altogether to the needs of society, to change them as institutions. It is no longer reform but revolution that has come to challenge us. And it is not so plain what is the role of the academic in such an enterprise....And in my view, through my perspective, the issues would have to do with how one gives back initiative and a sense of potency, how one activates to tempt one to want to learn again...curriculum not as a subject but as an approach to learning and using knowledge" (1971, p. 20).

If two-year colleges remain dedicated to egalitarian principles and mastery learning, they will need to address the recognized problem of mismatched non-cognitive factors. Such recognition must result in significant changes in the way subject matter instruction is planned and delivered. One response to the challenge of providing education for each will undoubtedly focus on competency-based education, and this may well represent a first step toward the mastery learning model proposed by Bloom. To make mastery learning a reality, however, multiple path instruction must also be developed with full recognition of the learners' identified cognitive and non-cognitive factors.

Educational psychologists and educators know a great deal about learning. For example, they know that students are likely to learn when they are ready to learn, when they want to learn, when they know what they are going to learn, when they are involved in the learning process, and when the consequences of learning are favorable. In other words, educators are convinced that students will probably learn if they are ready, motivated, directed, participatory, and reinforced. Each of these learning essentials carries with it a cognitive and non-cognitive consideration. For example, readiness implies cognitive factors

of skill and knowledge readiness as well as attitudinal readiness (Mager, 1972). Motivation is primarily non-cognitive and internalized so that the individual is able to make sense of what and how learning is to proceed. Directivity includes both cognitive and affective objectives, which must be perceived as reasonable and desirable. Sustained participation in the learning process requires comfort with mode, content, structure and affiliations. Finally, reinforcement implies consequences of learning that are favorable to the learner so as to increase the probability of perseverance.

The hidden obstacle imbedded in the new generation gap is two-fold: administrators are deeply involved in survival-maintenance activities such as efficiency, collective negotiations, political pressures, energy considerations, part-time faculty, and so on. And faculty are equally involved with practices directed toward the older student whose traditional values are similar to their own. These two factors tend to divert the attention of both administration and faculty from the recognition of the new generation gap and the motivation to develop the new instructional strategies needed for these younger students.

This research identifies a new generation gap as well as wide variability in non-cognitive factors within populations of post-secondary students. Whatever the reason for these differences, present conditions demand that community college educators take the lead in the instructional revolution. The age of books is over. The age of technology and individualism is here. Failure to respond to the challenge of providing meaningful instruction for <u>each</u> will undoubtedly increase the probability that some other organization will replace the community-junior college postsecondary institution representing all people.

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